UNIVERSITÉ DE GENÈVE
SANTÉ AU TRAVAIL, ENVIRONNEMENT, PRÉVENTION, SÉCURITÉ

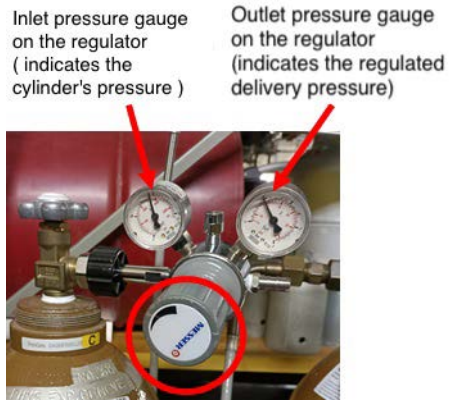
Connecting and disconnecting a gas cylinder

General instructions and operating procedure - Dec 2022 version

Context / Action	Hazard	Details	Safety instructions
Before doing anything			
All types of activities involving gases	• Lack of oxygen (asphyxiation) • Poisoning • Fire / explosion • Falling object • Projectile object • Pressurized cylinder		• **You must carefully read the operating manual of the pressure regulator before using it.** • It is only after receiving special authorisation, and after completing the necessary **(both technical and safety)** training programmes, that you can operate pressure regulators. • **You should complete the training module on gas hazards available on the STEPS training platform.** (www.unige.ch/steps/formation).
Working environment	Uncontrolled release of gas, failure of containment in the cylinder (leading to asphyxiation, fire, ...)		• Any action performed on a gas cylinder must be done in the open air or **in spaces that are fitted with a permanent mechanical ventilation system.** • When working with gas cylinders, you must only use pieces of equipment (such as pressure regulators) that are clean and in good working condition.
Manual handling of loads	• Cuts, grazes, scratches to the skin when there is contact with metal parts that have not been deburred • Release of pressurized gas • Falling heavy object		• When transporting a cylinder, use a suitable gas cylinder trolley (gas cylinder cart) • Wear : o Manual handling gloves o Appropriate work clothing o Closed shoes
Ensuring the gas cylinder is in a stable and secure position	Falling object		The cylinder must be securely fastened at 2/3 of its height to a fixed structure, and during transport it must be securely fastened to its trolley (cart). 

Action	Hazard	Details	Safety instructions
Connecting the gas cylinder to the pressure regulator			
Removing the cylinder's protective cap	Cuts to the skin after contact with metal parts that have not been deburred		Wearing protective gloves is recommended.
Checking the pressure regulator	Uncontrolled leaking/release of gas when the pressure regulator is in use, caused when: • There are issues with airtightness (airtight seal /gasket is damaged, deformed, cut …) • The pressure regulator being used is not suitable for this type of gas or gas mixture		• **Check that the pressure regulator is suitable for the type of gas** or gas mixture contained in the cylinder (check the markings on the pressure regulator) • Perform a visual check of the pressure regulator's condition (eg, lack of impact damage, corrosion) • Check for cracks or scratches or any other kind of physical deformation on the ring-shaped gasket located at the pressure regulator's point of connection with the cylinder. **If the gasket is damaged, it MUST be replaced with a new one of an approved material type.**

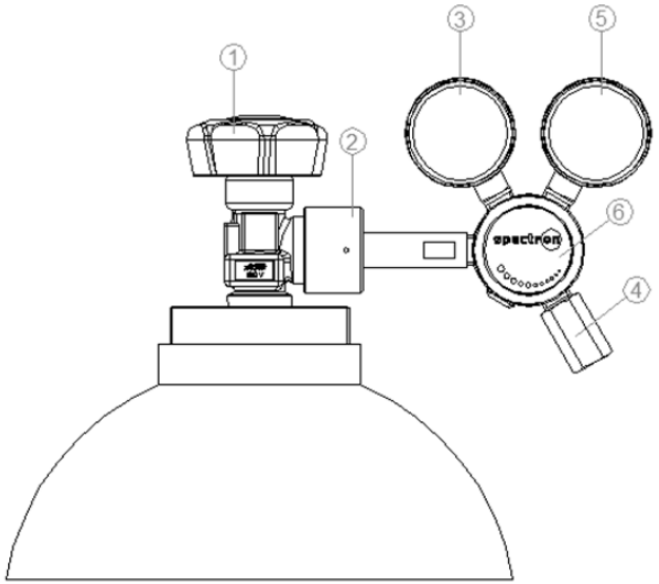
Action	Hazard	Details	Safety instructions
Connecting the pressure regulator to the cylinder			• Ensure the cylinder's connection point and the pressure gauge are properly aligned • If the connection contains an O-ring seal (gasket/toric joint), tighten the nut on the pressure regulator by hand. For other types of connections, tighten using a spanner (wrench).
Opening the cylinder valve	Uncontrolled leaking/release of gas when the pressure regulator is in use, caused when: • There are issues with airtightness (airtight seal /gasket is damaged, deformed, cut …) • The pressure regulator being used is not suitable for this type of gas or gas mixture		• **Use your hand to slowly open the cylinder valve** by turning the handle in an anti-clockwise direction (one turn is enough). • **Check the airtightness of the connection to the regulator** using a leak detector spray. • **If there is a leak, close the cylinder valve** and remove the pressure regulator. • Never turn the cylinder valve open all the way to the end (→ risk of the valve getting stuck in an open state)

Action	Hazard	Details	Safety instructions
Using the pressure regulator to check the cylinder pressure and regulate the gas delivery pressure	Release of pressurized gas		• **Slowly turn the handle for the regulator valve** (in a clockwise direction) – this is how you adjust the delivery pressure (outlet pressure) to your desired level • Never stand in front of any opening behind which there is pressurised gas 

Action	Hazard	Details	Safety instructions
Disconnecting the pressure regulator from the gas cylinder			
Closing the cylinder valve			• **Close the cylinder valve slowly by hand,** turning its handle in a clockwise direction.
Purging the pressure in the regulator (see footnote 1)	Release of pressurized gas		• Turn the regulator valve handle. • **Expose the regulator to the ambient air.** Read the pressure values on the gauges – check that they indicate an absence of pressure (0 bar). • Never stand in front of any opening behind which there is pressurized gas. 

Action	Hazard	Details	Safety instructions
Disconnecting the pressure regulator from the gas cylinder			• Use your hand to unscrew the nut of the pressure regulator if the connection to the cylinder contains an O-ring seal (gasket/toric joint). For other types of connection use a spanner (wrench).
Screw the cylinder's protective cap back on.	No cap → failure of gas containment after cylinder falls over: • Release of pressurized gas • Projectile object		Wearing protective gloves is recommended.

(1) Pressure relief valves with a pipe-away feature are present on pressure regulators used for **flammable, toxic or corrosive gases**. If using these gases, these relief valves must be hooked up to a piping system that connects to a safe and secure recycling unit that is suitable for the gas being used. If you are working with **oxygen** indoors, the pressure regulators you are using have pressure relief valves with a pipe-away feature – you must ensure that there is a connection whereby exhaust oxygen is safely vented through the pipe-away feature of the relief valve to the outside environment, and far away from any flame or potential source of ignition.



Label in diagram	Name of part
1	Handle of cylinder valve
2	Connection for joining the regulator to the cylinder
3	Inlet pressure gauge (indicates cylinder pressure)
4	Pressure relief valve with pipe-away feature
5	Outlet pressure gauge (indicates delivery pressure of the regulator)
6	Adjustable handle of the regulator valve (sets the delivery pressure)